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246. Proposed by C. N. SCHMALL, 89 Columbia Street, New York City.

Derive Taylor's Series by the use of the formula for successive integration by parts, and nothing else.

MECHANICS.

207. Proposed by W. J. GREENSTREET, M. A., Marling School, Stroud, England.

A portion of a parabola is bounded by the curve, the axis and an ordinate. A circle is inscribed to the figure which is regarded as a plane lamina. The area of the inscribed circle is now punched out. Find the centroid of what is left.

NUMBER THEORY AND DIOPHANTINE ANALYSIS.

148. Proposed by R. D. CARMICHAEL, Anniston, Ala.

Find all the multiply perfect numbers of n different prime factors and of multiplicity $n-1$.

AVERAGE AND PROBABILITY.

191. Proposed by J. EDWARD SANDERS, Reinersville, Ohio.

Two random lines cut a given circle. What is the chance that they intersect within the circle?

192. Proposed by A. H. HOLMES, Brunswick, Maine.

In the game of baccarat the dealer and each side of the table have two or three cards. The object is to get as near nine as possible, and tens and court cards do not count. If the two first cards dealt do not together amount to five, the player asks for another. If above five he does not. When the two cards amount to exactly five would the chances of the hand be bettered or diminished by drawing a third card, and how much?

MISCELLANEOUS.

173. Proposed by G. B. M. ZERR, A. M., Ph. D., 4243 Girard Avenue, Philadelphia, Pa.

If n is odd, prove the following: $\pm 1 = [(-1)^{1/n} + (-1)^{-(1/n)}] [(-1)^{2/n} + (-1)^{-(2/n)}] [(-1)^{3/n} + (-1)^{-(3/n)}] \dots [(-1)^{(n-1)/2n} + (-1)^{-(n-1)/2n}]$
 $\pm \sqrt[n]{n} (-1)^{(n-1)/4} = [(-1)^{1/n} - (-1)^{-(1/n)}] [-(-1)^{2/n} - (-1)^{-(2/n)}] [(-1)^{3/n} - (-1)^{-(3/n)}] \dots [(-1)^{(n-1)/2n} - (-1)^{-(n-1)/2n}]$.

174. Proposed by L. E. DICKSON, Ph. D., Associate Professor of Mathematics, The University of Chicago.

By a linear transformation with integral coefficients modulo 2, reduce $\sum x_i^2 + \sum x_i x_j$ ($i, j=1, \dots, 2m; i < j$) to a canonical form in which the variables are separated into pairs.